CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: August 12, 1948 Released: August 12, 1948

AIRLINE TRANSPORT CARRIERS, INC., —COALINGA, CALIFORNIA— JANUARY 28, 1948

The Accident

At approximately 1050,* January 28, 1948, a DC-3, aircraft NC-36480, owned and operated by Airline Transport Carriers, a non-scheduled carrier, crashed near Coalinga, California. All of the 29 passengers and the crew of 3 were fatally injured. The aircraft was destroyed by impact and fire.

History of the Flight

The flight departed from its operating base, Burbank, California, for Oakland, California, at 0646, January 28, 1948. According to company instructions, the crew consisting of Francis Charles Atkinson, captain; Marion Harlow Ewing, first officer; and Mrs. Francis Charles Atkinson, stewardess, were to fly NC-79055, which was certificated to carry 32 passengers, however, the crew made a mistake and departed in NC-36480. This airplane was certificated to carry only 26 passengers and was 7 hours overdue for a 100-hour inspection at the time of departure from Burbank.**

Landing at Oakland was accomplished at 0849. The trip had been routine, and somewhere between Burbank and Oakland the pilot apparently realized that he was flying the wrong airplane for he requested his landing instructions from the Oakland tower with the appropriate airplane call numbers, 480. In Oakland, 28 Mexican Nationals and one United States Immigration official were enplaned for a flight to the Imperial County Airport, Imperial County, California. This flight was to be performed under a contract which the company had with the United States Immigration and Naturalization Service.

Since NC-36480 had accommodations for only 26 passengers, three of the 28 Mexican Nationals who boarded the aircraft were unable to be seated where they could be secured with safety belts. According to the statement of a United States Immigration official who assisted in the loading, three pieces of unsecured luggage were in the aisle at the time of take-off, and it is probable that the three passengers were seated on this luggage after the aircraft taxied from its parking area at the Oakland Airport for take-off. The remainder of the airplane load consisted of 375 gallons of fuel. Total weight was 67 pounds in excess of the maximum allowable.

No flight plan was filed for the southbound trip since clear weather conditions prevailed over the route to the Imperial County Airport. Take-off was accomplished at approximately 0930. Before leaving the Oakland tower frequency Captain Atkinson received a message from his company, relayed through the tower, that he was to return directly to Burbank. His acknowledgment of this message was the last communication received from the flight.

One hour and 35 minutes after the aircraft had departed from Oakland, it was observed over the vicinity of Coalinga, California, cruising at an estimated altitude of 5,000 feet above the ground. At this time a trail of white vapor or smoke, 150 to 200 feet long, was observed streaming from the left engine of the aircraft. Ten to 15 seconds later flames were seen flowing from the left engine over the wing and back to the empennage. Seconds later the left wing and the left engine dropped free from the rest of the aircraft; and the airplane fell out of control, crashed to the ground, and burst into flames.

Investigation

The main portion of the wreckage was concentrated in an area approximately 75 feet in diameter. The fuselage, right wing, and right engine were destroyed by fire. The left wing had separated from the aircraft in flight and was found one-half to three-fourths of a mile from the main body of the wreckage. The left engine which also had fallen from the aircraft in flight had struck a hillside 600 feet above the main wreckage and had rolled down the hill, coming to rest 150 feet below the wreckage.

With the exception of the left engine fuel pump and left wing, no part of the aircraft or any of its components indicated structural failure or mechanical malfunction prior to the time

* The times noted in this report are Pacific Standard and based on the 24-hour clock.

** This report is concerned only with the accident investigation, and the question of violations will be treated in a separate proceeding (CAA vs Airline Transport Carriers, Inc., Docket No. SR-6151).

of impact. The fuel pump was removed from the left engine. The four studs which held the castings of the pump-case together were loose, and the parts of the case could be moved with finger pressure. When the pump was disassembled, it was found that the separating gasket between the castings was broken on the intake or low pressure side of the pump. The pump was reassembled as nearly as possible to the condition it had been at the time of removal from the engine, and was then bench checked. Test fluid flowed freely through the broken portion of the gasket. The four connecting studs were tightened, but test fluid continued to flow through the break in the gasket. Fluid was then fed to the pump under 18-pound pressure, which would have been the pressure supplied from the booster pumps in the aircraft. This test resulted in the fluid being sprayed from the pump in large quantities.

A portion of the fire wall which had been located directly behind the left fuel pump was found with a heavy deposit of carbon particles on the forward side. Fire from the fuel pump, and around this part of the fire wall could be traced through the rest of the engine nacelle to the main wing spar. The left wing and the main spar directly behind the left engine showed evidence of being subjected to considerable heat and fire, and fire had burned through the top section of the wing and through the main spar.

NC-36480 was equipped with two Pratt and Whitney R-1830 engines on which were installed Hamilton Standard Hydromatic propellers. The left engine had a total of 826 hours, of which 396 had been accumulated since its last overhaul. The right engine had a total of 309 hours since date of manufacture. Weather during the course of the flight was clear and was not a factor in this accident.

Airline Transport Carriers, Inc. had purchased the left engine driven fuel pump from the Jones Aviation Service Company, Santa Monica, California. The Jones Aviation Service Company is a partnership engaged exclusively in the overhaul of engine accessories, including starters, generators, fuel pumps, vacuum pumps, hydraulic pumps, relays, regulators, actuators, reverse current relays, check valves, relief valves, and by-pass valves. They employed eight mechanics, five of whom held engine mechanic certificates from the Civil Aeronautics Administration. According to one of the partners, all work was accomplished by or under the supervision of a certificated engine mechanic, and all accessories were as a matter of practice bench checked or inspected by this partner. The firm held no certificate from the Civil Aeronautics Administration; none was specifically required by the provisions of the Civil Air Regulations.

An inspection of the maintenance facilities and the aircraft records of Airline Transport Carriers disclosed that the company was adequately equipped to maintain its airplanes, and the company's aircraft records showed that required maintenance was being performed. Had the company established some means of notice, other than the aircraft log itself, that an aircraft was overdue for an inspection or otherwise out of commission, the mistake made by the crew in this case of taking the wrong airplane might not have occurred. A simple method of providing such notice would be placing a red tag on the pilot's control column. With this exception, no discrepancies or defects were found in the company's operation policies or practices which could be considered as contributory to this accident.

Discussion

The error of the crew in taking the wrong airplane and their overloading the aircraft with 3 passengers, who were not provided with safety belts, certainly indicated laxness and poor judgment on the part of the crew, but these considerations did not materially contribute to the cause of the accident. The left wing failed as a result of fire damage, and all evidence found during the course of the investigation points to the defective fuel pump as the source of the fire.

The fuel stained portion of the fuel pump castings, where the break in the separating gasket was located, showed that the fracture had existed for a considerable period of time before the accident. It is highly possible that the fuel pump was in this condition prior to expiration of the time for the 100-hour inspection, which was 7 hours overdue when the aircraft was flown from Burbank; and it is questionable whether the condition of this fuel pump would have been discovered during the course of 100-hour inspection unless the fuel system were examined under pressure. The defect, latent in character, was certain of discovery only by removal of the pump and examination of its parts.

The source of ignition was not definitely determined. The most likely possibility is that the fuel as it was sprayed through the lower left side of the engine cowling was ignited from the exhaust stack. Fire then progressed through zone 3 of the engine nacelle and into the wing panel, the intensity being sufficient to burn through the main wing spar. It is possible that the leak in the pump was sufficient to cause a drop or a fluctuation in fuel pressure; and that the pilot then turned the booster pumps on, which resulted in fuel being sprayed from the pump in large quantities.

A pump thoroughly overhauled should be capable of at least 1,000 hours of service on an

aircraft. It is difficult to understand how the particular failure found in this fuel pump could have occurred if the gasket had been installed new at the time of overhaul, and if the pump had been properly bench tested before being made available for use. It is not known when the fuel pump was actually installed on the engine. However, the engine had a total of 396 hours since its last overhaul, and the fuel pump was probably installed on the engine at the time of engine change, therefore, having a total of 396 hours of service.

Findings

Upon the basis of all available evidence, the Board finds that:

1. The company was a non-scheduled air carrier operating under a letter of registration issued by the Civil Aeronautics Board, and an operating certificate issued by the Civil Aeronautics Administration.

2. The aircraft was properly certificated, but had been flown 7 hours beyond its 100-hour inspection period at the time of its take-off from Burbank, and nine hours and 44 minutes beyond its 100-hour inspection period at the time of take-off from Oakland.

3. Though the aircraft was certificated to carry a crew of 3 and 26 passengers, a total of 32 persons was carried on this particular flight, and the aircraft was loaded 67 pounds in excess of the maximum allowable.

4. The separating gasket in the left engine fuel pump showed signs of being fractured prior to the time of the last flight. The defect was latent in character, and one which might not have been found during the course of a 100-hour inspection.

5. Fuel escaping from the left engine driven fuel pump was ignited while the aircraft was in flight. The fire progressed into the wing panel and burned through the main spar of the left wing.

6. The left wing, after its main spar burned in two, failed, and the airplane dived into the ground and was destroyed by impact and fire.

Probable Cause

The Board determines that the probable cause of this accident was the failure of the left wing in flight as a result of damage by fire which had its source in a defective left engine driven fuel pump.

BY THE CIVIL AERONAUTICS BOARD:

/s/ JOSEPH J. O'CONNELL, JR.
/s/ OSWALD RYAN
/s/ JOSH LEE
/s/ HAROLD A. JONES
/s/ RUSSELL B. ADAMS

Supplemental Data

Investigation and Hearing

The Board was notified of the accident approximately 1200, January 28, 1948, and an investigation was immediately initiated in accordance with Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. Investigators from the Board's Oakland office proceeded to Coalinga, arriving at the scene of the accident at approximately 1545 the same day, and were subsequently assisted in the investigation by other personnel of the Board's Safety Bureau. A public hearing was ordered and was held at Santa Monica, California, February 13, 1948.

Air Carrier

Airline Transport Carriers was incorporated in the State of California and maintained its principal offices at the Lockheed Air Terminal, Burbank, California. At the time of the accident, Airline Transport Carriers was operating under an irregular air carrier letter of registration issued by the Civil Aeronautics Board, and a non-scheduled air carrier operating certificate issued by the Civil Aeronautics Administration.

Flight Personnel

Captain Francis C. Atkinson, age 30, of Long Beach, California, was pilot of the aircraft. At the time of the accident, he possessed a valid airline transport pilot rating and had accumulated a total of 2,850 flying hours, of which 2,200 had been obtained in DC-3 aircraft. Marion Harlow Ewing, age 32, of Balboa, California, was co-pilot. At the time of the accident, he possessed a valid airline transport pilot rating and had accumulated a total of 4,205 flying hours, of which 600 had been obtained in DC-3 aircraft. Mrs. Francis Charles Atkinson was stewardess.

Aircraft

The Douglas DC-3-C, NC-36480, had been operated a total of 2,868 hours since its original manufacture in July 1945. It was equipped with two Pratt and Whitney R-1830 engines, on which Hamilton Standard Hydromatic propellers were installed. The left engine had been operated a total of 826 hours, of which 396 had been accumulated since its last overhaul. The right engine had been operated a total of 309 hours since original manufacture. At the time of departure from Oakland, California, the total weight of the aircraft was approximately 67 pounds in excess of the maximum allowable gross; however, the load was distributed with respect to the center of gravity within approved limits.